

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 10

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PATRICK J. MONAHAN

Appeal No. 96-0640
Application 08/127,178¹

ON BRIEF

Before GRON, PAK and OWENS, Administrative Patent Judges.

GRON, Administrative Patent Judge.

DECISION ON APPEAL UNDER 35 U.S.C. § 134

¹ Application for patent filed September 27, 1993.

Appeal No. 96-0640
Application 08/127,178

This is an appeal under 35 U.S.C. § 134 of an examiner's rejection of Claims 1-10, all the claims pending in this application.

Introduction

Claims 1-10 stand rejected under 35 U.S.C. § 103 as being unpatentable in view of the teaching of Metzger, U.S. 4,079,162, patented March 14, 1978, combined with applicant's purported admission that "it is commonly known to add mass to the ceramic discs to reduce their resonant frequencies at pages 1-2 of the instant specification under their description of the prior art" (Examiner's Answer (Ans.), p. 3).² Claims 1 and 8 are representative of the claimed subject matter and read:

² The examiner appears to be relying on the following statement at page 2 of the specification:

One known method of acoustic matching is mass-loading the bimorphs whose resonant frequency is too high, i.e., the process of adding mass to an object to dampen the resonant frequency thereof. Conventional mass-loading techniques comprise affixing pre-fabricated damping elements, such as tiles or weights, to an object to add mass to the object, however, the ceramic transducer discs pose a special problem in that ceramic discs are mounted in very close proximity, and the conventional damping elements do not fit within the predetermined size constraints of the mounting fixture.

1. A mass-loaded coating for reducing the resonant frequency of a rigid element comprising:

an adhesive matrix; and

a predetermined mass of a dense granular weighting material which is mixed with said adhesive matrix in a ratio of approximately 3:1 by mass.

8. A method of reducing the resonant frequency of a rigid element comprising the steps of:

adhesive applying a layer of an uncured adhesive matrix over
an outer surface of said rigid element, said
matrix including a predetermined mass of a dense
granular weighting material which is mixed with said
adhesive matrix in a ratio of approximately 3:1 by
mass; and
wherein curing said adhesive matrix to a hardened state
said coating mass-loads said rigid element and
reduces the resonant frequency thereof.

Discussion

The examiner has the initial burden to establish a *prima facie* case of obviousness under 35 U.S.C. § 103. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1998); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir.

Appeal No. 96-0640
Application 08/127,178

1984). Here, the examiner has not satisfied his initial burden.

The examiner argues (Ans., pp. 8):

It would have been obvious . . . to use approximately 3 parts of lead powder or other dense filler of Metzger to one part of polymer by mass because such large quantity of lead is expected to give a film having a large mass due to the large density of lead which is expected to result in greater resonant frequency reduction of an object coated therewith according to applicant's admission that resonant frequency is inversely proportional to the objects [sic] mass. The use of large amounts of filler is also expected by the ordinary skilled artisan to increase the properties which the ordinary skilled artisan normally uses fillers to achieve

Even presuming that persons having ordinary skill in the art would have been aware that mass is inversely proportional to resonant frequency, we are not convinced that appellant's claimed mass-loaded coatings and methods of reducing the resonant frequency of a rigid element by applying said coatings, are unpatentable primarily because the examiner finds that generally "[t]he use of large amounts of filler is also expected by the ordinary skilled artisan to increase the properties which the ordinary skilled artisan normally uses

Appeal No. 96-0640
Application 08/127,178

fillers to achieve" (Ans., p. 8). We are struck by the dearth of evidence to which the examiner points in support of his holding that mass-loaded coatings with a ratio of dense granular weighting material to adhesive matrix of approximately 3:1 by mass and processes for reducing the resonant frequency of a rigid element by applying said coatings, reasonably would have been obviousness to a person having ordinary skill in the art in view Metzger's teaching and applicant's purported admission.

We find that Metzger reasonably would have taught persons having ordinary skill in the art that soundproofing structures may take the form of soundproof panels, sheets, films, putties and spray coatings which comprise at least two parts by volume of hollow microspheres, one part per volume of an adhesive binder, and optional fillers selected from "powdered lead or aluminum and other fillers which have a high density"

(Metzger, col. 4, l. 63-65). See also Metzger, col. 3, l. 37-45; col. 4, l. 62-65; and col. 5, l. 58, to col. 6, l. 42.

However, we find no objective evidence in Metzger which would have led persons having ordinary skill in the art reasonably to expect that soundproof panels, sheets, films, putties or spray coatings comprising a dense granular weighting material

Appeal No. 96-0640
Application 08/127,178

dispersed in a curable adhesive matrix at a weight ratio of a 3:1, are feasible, practical, or desirable. There appears to be little basis in the applied prior art for the examiner's view that Metzger reasonably would lead persons having ordinary skill in the art to make and effectively use soundproof coatings comprising approximately three parts by weight of lead powder interspersed into each part by weight of an adhesive binder which already has interspersed therein at least two parts by volume of hollow microspheres per volume of adhesive binder, the hollow microspheres being a most significant feature of Metzger's soundproof structures (Metzger, col. 2, l. 1-32, and col. 2, l. 49, to col. 3, l. 28). Metzger states (Metzger, col. 3, l. 29-36):

[T]he spheres are disposed quite close to each other but preferably not touching each other. This arrangement is believed to be provided by thoroughly mixing or blending the microspheres and the not yet cured epoxy resin. This blending must be for sufficiently long time period so that the consistency is fairly uniform with the binder encapsulating by far the majority of the microspheres.

When dispersing the microspheres into the uncured resin, Metzger teaches (Metzger, col. 4, l. 43-49):

Another significant factor is the viscosity of the material in its uncured state. It is desirable to have this viscosity as low as possible. It has been found that the viscosity should preferably be less than 10,000

Appeal No. 96-0640
Application 08/127,178

centipoises. With this relatively low viscosity it is easier to add more filler material such as glass spheres which, as mentioned previously, is desirable.

Even if we presume that Metzger would have enabled persons skilled in the art to make soundproofing coatings comprising an epoxy or polyurethane adhesive binder, at least two parts by volume of hollow microspheres per part by volume of binder, and approximately three parts by weight of a dense granular weighting material per part by weight of binder, the mere fact that the soundproofing coating might be modified to include three parts by weight of dense granular weighting material per part by weight of adhesive binder would not have made the modification obvious to a person having ordinary skill in the art unless the prior art suggested the desirability of the modification. See In re Laskowski, 871 F.2d 115, 117, 10 USPQ2d 1397, 1398-99 (Fed. Cir. 1989).

We are hardpressed to understand the examiner's explanation why persons having ordinary skill in the art would have been motivated by the combination of Metzger's teaching and a known inverse relationship between density and resonant frequency to add approximately three times the weight of dense granular weighting material to the adhesive binder of Metzger's hollow microsphere-filled, uncured binder. In

Appeal No. 96-0640
Application 08/127,178

support of the examiner's holding, Metzger teaches that (1) conventional soundproof structures transmit 4-5 less decibels for each doubling of their weight over a large portion of the audio frequency range (Metzger, col. 1, l. 47-50), and (2) powdered lead or aluminum and other fillers which have a high density can be incorporated into his soundproofing coatings (Metzger, col. 4, l. 63-65). Metzger also states (Metzger, col. 3, l. 1-10; emphasis added):

[T]he sound, as it strikes the surface and starts penetration of the material, will be refracted as indicated in Fig. 2. The amount of refraction is a function of the difference in densities of the materials forming a change in the refraction boundary. As indicated in Fig. 2 the difference in densities between the epoxy resin binder 10, the glass microspheres 12, and the entrapped reduced atmospheric pressure within the microspheres, causes a continuing process of refraction, reflection and absorption.

However, contrary to the recognized conventional relationship between sound transmission and the weight of the soundproof structures which Metzger recognizes at column 1, lines 47-50, Metzger expressly states, "[I]t is desirable that the specific gravity be as small as possible so that the panels are lightweight" (Metzger, col. 4, l. 20-21). It appears that Metzger's primary goal is "[t]o increase the

Appeal No. 96-0640
Application 08/127,178

volume ratio of spheres to binder material" (Metzger, col. 5, l. 4-5). Metzger teaches (Metzger, col. 2, l. 22-32):

In accordance with this invention it has been further found that by providing at least twice the volume of microspheres to the volume of the resin, improved attenuation follows. It is theorized that by providing as large a volume of microspheres as possible that firstly there is a larger vacuum volume and secondly a wave traveling through the material will experience an increased number of transitions between materials of different index of refraction (glass-resin-vacuum).

Accordingly, we find that persons having ordinary skill in the art reasonably would have learned from Metzger's disclosure that sound transmission is reduced much more by increasing the number of materials having different indices of refraction through which the sound must travel, refraction being a function of the difference in densities of the materials (Metzger, col. 3, l. 1-6), than by maximizing the differences in the densities of the refracting materials. Our finding is consistent with Metzger's desire that the specific gravity of the base materials be as small as possible and that the soundproofing structure most desirably be lightweight (Metzger, col. 4, l. 18-21).

Thus, while the examiner argues that it is within the ordinary skill of the artisan optimize amounts of filler (Ans., pp. 3-4), we find that optimization in line with

Appeal No. 96-0640
Application 08/127,178

Metzger's teaching as a whole would have led persons having ordinary skill in the art away from making and using soundproofing coatings which are filled with large amounts of powdered lead or aluminum dispersed in an adhesive binder which is most desirably filled to at least twice its volume with hollow microspheres. References are to be considered for everything they fairly suggest to a person having ordinary skill in the art. In re Burckel, 592 F.2d 1175, 1179, 201 USPQ 67, 70 (CCPA 1979); In re Lamberti, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976). Accordingly, we reverse the examiner's rejection of Claims 1-10 under 35 U.S.C. § 103.

Other Issues

We remand this case to the examiner with our recommendation that he determine the scope of the subject matter claimed before proceeding to determine the patentability of the claimed subject matter under 35 U.S.C. § 103. Before considering issues of patentability under sections 102, 103, and 112, first paragraph, one must first determine the full scope of the subject matter claimed. See In re Wilder, 429 F.2d 447, 450, 166 USPQ 545, 548 (CCPA 1970); In re Geerdes, 491 F.2d 1260, 1262, 180 USPQ 789, 791

Appeal No. 96-0640
Application 08/127,178

(CCPA 1974); In re Moore, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971). In our view, the examiner should have determined the scope of the subject matter claimed before he determined the field of invention and compared the pertinent prior art therein to the subject matter appellant's claims. For example, the examiner should have first determined (1) the effect of the functional language, (2) the broadest reasonable interpretation to be accorded the terms "coating" and "adhesive matrix" consistent with the description of the invention in the specification (see In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989)), and (3) the full scope of the term "dense granular weighting material" before considering the novelty, obviousness, and/or enablement of the claimed subject matter. Our remarks here are elicited by prior art cited and summarized in herein newly cited Lilley et al., U.S. 5,278,219, patented January 11, 1994 (prior art under 102(e) based on a filing date of June 25, 1992)(attached).

Conclusion

We reverse the examiner's rejection of Claims 1-10 under

Appeal No. 96-0640
Application 08/127,178

35 U.S.C. § 103 in view of Metzger and prior knowledge in the art acknowledged at page 2 of the specification.

We remand this application to the examiner for action consistent with this decision and supporting opinion.

The application, by virtue of its "special" status, requires immediate action. See Manual of Patent Examining Procedure, § 708.01(d). It is important that the Board of Patent Appeals

Appeal No. 96-0640
Application 08/127,178

and Interferences be informed promptly of any action affecting
the appeal.

REVERSED, REMANDED

TEDDY S. GRON)	
Administrative Patent Judge))	
)	
)	
CHUNG K. PAK)	BOARD OF PATENT
Administrative Patent Judge))	APPEALS AND
)	INTERFERENCES
)	
TERRY J. OWENS)	
Administrative Patent Judge))	

bae

Appeal No. 96-0640
Application 08/127,178

Office of Counsel
Building 112T
Naval Undersea Warfare Center
Division, Newport
Newport, RI 02841-5047